

## **Claims**

1. (~~CURRENTLY AMENDED~~) A method of controlling transmission of media access control (MAC) data packets with MAC headers in a power line communication (PLC) local area network (LAN) having a plurality of PLC stations and at least one PLC media access control (MAC) bridging device for bridging packets between the PLC LAN and a non-PLC LAN, the method comprising:

providing a PLC central coordinator in the PLC LAN for managing allocation of PLC LAN resources;

assigning by the PLC central coordinator a temporary equipment identifier (TEI) for each PLC station and PLC MAC bridging device;

at a PLC MAC bridging device, for a packet from a non-PLC source station wherein the packet has a MAC header containing the source MAC address and the destination MAC address for a PLC destination station, ~~replacing~~ ~~removing~~ the source MAC address and destination MAC address ~~in from~~ the MAC header ~~with~~ and inserting into the MAC header a ConnectionID, the ConnectionID identifying the PLC MAC bridging device's TEI and the PLC destination station's TEI; and

transmitting said packet with said ConnectionID from the PLC MAC bridging device to the PLC destination station .

2. *(CURRENTLY AMENDED)* The method of claim 1 further comprising:

at the PLC MAC bridging device, for a packet from a PLC source station wherein the packet has a MAC header containing a ConnectionID, the ConnectionID identifying the PLC source station's TEI and the PLC MAC bridging device's TEI, ~~replaeing removing~~ the ConnectionID in the MAC header ~~with and inserting into the MAC header~~ the source MAC address and destination MAC address for a non-PLC destination station; and

transmitting said packet with said source and destination MAC addresses from the PLC MAC bridging device to the non-PLC destination station .

3. *(PREVIOUSLY CANCELED)*

4. *(PREVIOUSLY AMENDED)* The method of claim 1 wherein the PLC MAC bridging device caches a source TEI and a source 48-bit MAC address of all broadcast data packets received from other bridge devices on the PLC LAN.

5. *(PREVIOUSLY AMENDED)* The method of claim 1 wherein the PLC MAC bridging device establishes a connection for bridged traffic only when traffic from a non-PLC LAN source station is received for a destination station on the PLC LAN where the destination station's TEI, bridging device's TEI and destination station 48-bit MAC address are cached in the bridging device.

6. *(PREVIOUSLY AMENDED)* The method of claim 1 wherein the PLC MAC bridging device establishes a connection for bridged traffic only when traffic from a PLC LAN source station is received for a destination station not on the PLC LAN where the bridging device's TEI and destination station 48-bit MAC address are cached in the bridging device.

7. *(PREVIOUSLY AMENDED)* The method of claim 1 which includes establishing a unique connection for every pair of stations that cross a PLC MAC bridging device.

8. *(ORIGINAL)* The method of claim 1 which includes bridging packets across the PLC LAN only in PLC bridging devices.

9. *(PREVIOUSLY CANCELED)*

10. *(PREVIOUSLY AMENDED)* The method of claim 1 which includes interworking the bridged packets between the PLC LAN and a non-PLC LAN using the ConnectionID and TEIs only in the PLC LAN and using 48-bit MAC addresses outside the PLC LAN.

11. *(PREVIOUSLY CANCELED)*

12. *(PREVIOUSLY CANCELED)*

13. *(ORIGINAL)* The method of claim 1 which includes, for packet traffic transmitted intra-PLC, identifying a packet's source station and destination station by inspecting the ConnectionID field in the PLC MAC header and referencing a connection table.

14. (*CURRENTLY AMENDED*) A method of bridging media access control (MAC) data packets with MAC headers between stations in a power line communication (PLC) local area network (LAN) having at least one PLC MAC bridging device and stations in a non-PLC LAN, the method comprising:

providing a PLC central coordinator in the PLC LAN for managing allocation of PLC LAN resources;

assigning by the PLC central coordinator a temporary equipment identifier (TEI) for each PLC station and PLC MAC bridging device; ~~and~~

at a PLC MAC bridging device, for a first packet bridged from a non-PLC source station wherein said first packet has a non-PLC MAC header containing the source 48-bit MAC address and the destination 48-bit MAC address for a PLC destination station, modifying said first bridged packet by ~~replacing removing~~ the 48-bit MAC addresses ~~of from~~ the non-PLC MAC header ~~with~~ and inserting into the non-PLC MAC header a ConnectionID containing the TEI of the PLC destination station, and transmitting said modified first bridged packet with said ConnectionID from the PLC MAC bridging device to the PLC destination station; and

at a PLC MAC bridging device, for a second packet bridged from a PLC source station wherein said second packet has a PLC MAC header with a ConnectionID containing the TEI of the PLC source station and the TEI of said ~~at least one~~ bridging device, modifying said second bridged packet by ~~replacing removing~~ the ConnectionID ~~of from~~ the PLC MAC header ~~with~~ and inserting into the PLC MAC header the 48-bit MAC address of the non-PLC destination station, and transmitting said modified second bridged packet with the 48-bit MAC address of the non-PLC destination station and without said ConnectionID from the PLC MAC bridging device to the non-PLC destination station.

15. *(PREVIOUSLY AMENDED)* The method of claim 14 wherein said at least one PLC MAC bridging device establishes a connection for bridged traffic only when traffic from a non-PLC LAN source station is received for a destination station on the PLC LAN where the destination station's TEI, bridging device's TEI and destination station 48-bit MAC address are cached in the bridging device; and wherein said at least one PLC MAC bridging device establishes a connection for bridged traffic only when traffic from a PLC LAN source station is received for a destination station not on the PLC LAN where the bridging device's TEI and destination station 48-bit MAC address are cached in the bridging device.

16. *(PREVIOUSLY AMENDED)* The method of claim 14 wherein said at least one PLC MAC bridging device caches a source TEI and a source 48-bit MAC address of all broadcast data packets received from other bridging devices on the PLC LAN.

17. *(PREVIOUSLY CANCELED)*

18. *(PREVIOUSLY AMENDED)* The method of claim 14 which includes establishing a unique connection for every pair of stations that cross a PLC MAC bridging device.

19. *(PREVIOUSLY AMENDED)* The method of claim 14 which includes bridging packets across the PLC LAN only in PLC MAC bridging devices.

20. *(PREVIOUSLY AMENDED)* The method of claim 14 which includes, for packet traffic transmitted intra-PLC, identifying a packet's source station and destination station by inspecting the ConnectionID field in the PLC MAC header and referencing a connection table.

21. *(PREVIOUSLY CANCELED)*